

What is claimed is:

1. A frequency agile exciter assembly, comprising:
  - a delta-sigma modulator, having associated frequency characteristics, that produces a digital output signal;
  - a digital-to-analog converter that converts the digital output signal into an analog signal;
  - a clock circuit that provides a clock signal to the delta-sigma modulator and the digital-to-analog converter; and
  - a frequency control that controls at least one of the clock circuit, the delta-sigma modulator, and the digital-to-analog converter to alter the frequency characteristics of the delta-sigma modulator.
2. The assembly of claim 1, the frequency control controlling the clock circuit to alter respective center frequencies of at least one high dynamic range region associated with the delta-sigma modulator.
3. The assembly of claim 2, the delta-sigma modulator comprising at least one feedback register and the frequency control being operative to alter at least one scalar value associated with the at least one feedback register to change respective widths of at least one high dynamic range region associated with the delta-sigma modulator.
4. The assembly of claim 2, the delta-sigma modulator comprising at least one feedback register and the frequency control being operative to alter at least one scalar value associated with the at least one feedback register to change respective dynamic ranges of at least one high dynamic range region associated with the delta-sigma modulator.
5. The assembly of claim 1, the delta-sigma modulator comprising at least one feedback register and the frequency control being operative to alter at least one

scalar value associated with the at least one feedback register to change respective widths of at least one high dynamic range region associated with the delta-sigma modulator.

6. The assembly of claim 1, the delta-sigma modulator comprising at least one feedback register and the frequency control being operative to alter at least one scalar value associated with the at least one feedback register to change respective dynamic ranges of at least one high dynamic range region associated with the delta-sigma modulator.

7. The assembly of claim 1, the delta-sigma modulator outputting a one-bit digital signal.

8. The assembly of claim 1, further comprising a tunable filter having at least one passband having a center frequency, the frequency control being operative to vary the center frequency of the at least one passband.

9. The assembly of claim 8, the tunable filter comprising a surface acoustic wave (SAW) filter.

10. The assembly of claim 8, the tunable filter comprising at least one micromechanical structure that can be electrically configured to change the center frequency of the at least one passband associated with the filter.

11. The assembly of claim 1, the analog signal being a radio frequency signal.

12. The assembly of claim 1, the analog signal comprising a plurality of analog signals having respective associated frequencies, the assembly further comprising a channelizing filter that separates and filters the plurality of analog signals.

13. The assembly of claim 12, the frequency control being operative to vary the center frequencies of a plurality of passbands associated with the channelizing filter.

14. The assembly of claim 13, the channelizing filter comprising a surface acoustic wave filter comprising at least one micromechanical structure that can be electrically configured to change the center frequencies of plurality of passbands associated with the filter.

15. A digital frequency synthesizer having frequency agility, comprising:  
a digital-to-analog converter that receives a digital input signal and outputs an analog signal having an associated frequency;  
a tunable filter, having at least one passband with a respective central frequency, that filters the analog output signal; and  
a frequency control that is operative to alter the respective central frequencies of the at least one passband and one or more frequency characteristics of the digital-to-analog converter.

16. The digital frequency synthesizer of claim 15, the frequency control being operative to alter one or more frequency characteristics of the digital-to-analog converter.

17. The digital frequency synthesizer of claim 16, the tunable filter being a surface acoustic wave filter.

18. The digital frequency synthesizer of claim 17, the surface acoustic wave filter being electrically tunable via micromechanical structures within the filter.

19. The digital frequency synthesizer of claim 15, the digital input signal being a delta-sigma modulated digital signal.

20. A method of providing a frequency agile delta-sigma digital-to-analog converter (DAC), comprising:

altering at least one frequency characteristic associated with a delta-sigma modulator; and

configuring a tunable filter to an appropriate passband according to the frequency characteristics of the delta-sigma modulator.

21. The method of claim 20, the altering of at least one frequency characteristic including changing at least one programmable register within the DAC.

22. The method of claim 20, the altering of at least one frequency characteristic comprising altering a clock rate associated with the delta-sigma modulator and the method further comprising altering a clock rate associated with a digital-to-analog converter to match the clock rate of the delta-sigma modulator.

23. The method of claim 20, the altering at least one frequency characteristic further comprising converting the digital output of the delta-sigma modulator into an analog signal and summing the analog signal with a delayed representation of the analog signal.

24. The method of claim 20, the configuring of the tunable filter including electrically changing micromechanical structures within the filter.

25. A frequency agile exciter, comprising:  
means for converting a signal from a digital signal to an analog signal, the means having associated frequency characteristics;  
means for altering the associated frequency characteristics of the means for converting.

26. The exciter of claim 25, further comprising means for filtering the analog signal, the means having associated frequency characteristics.

27. The exciter of claim 26, the means for altering being operative to alter the frequency characteristics of the means for filtering.